B U L L E T I N

of the

United States Institute for Textile Research, Inc.

Vol. I May, 1931. No. 4

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Secretary's Temporary Office
65 Franklin St., Boston, Mass.

MEMBERS INVITED TO MEET WITH DIRECTORS TO INSPECT M. I. T. LABORATORIES SYMPOSIUM ON MARKETING RESEARCH

Your President extends a cordial invitation to all members of U. S. Institute to visit the textile research laboratories of Mass. Institute of Technology at 2 P. M., Tuesday, June 16th, and to attend the following open session of the Board of Directors to be held in Room 3309 of the M. I. T. Administration Building.

During the laboratory inspection members will be shown much novel and interesting textile testing and research apparatus, as well as the latest applications to textile analysis and research of optical and microscopical equipment, including micrometry, microtomy, photomicrography and the use of polarized light. In the X-ray laboratory members may become electrons metaphorically and "bat around on a tour of investigation" of the inside structures of textile fibres. The laboratory inspection will be personally conducted by Prof. George B. Haven and Prof. E. R. Schwarz.

The program for the following session at M. I. T. will include one or two reports on textile researches in progress at that institution, and a symposium, to be arranged by Chairman H. V. R. Scheel, of U. S. Institute sub-committee on economics, on "What is Being Done and What Can Be Done in the Field of Distribution Research in the Textile Industry." The Chairman is asking recognized authorities to introduce the subject from the view-point of the consumer, of the professional researcher, of the educational institution and of the industry, and these brief addresses and papers will be followed by general discussion. Among those who have promised to speak are A. W. Zelomak, of the Fairchild Publications, New York City, who will tell of the consumer's view-point, and Prof. R. F. Elder, of the Division of Business and Engineering Administration at M. I. T., whose subject will be The Coordination of Marketing and Fundamental Scientific Research.

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Special Notice.- The laboratory inspection will start promptly at 2 P. M. and those wishing to join the party should be at Room 3309 before that hour. The following session will convene about 3 P. M.

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The regular quarterly meeting of the Board of Directors will convene at the University Club, corner Trinity Place and Stuart Street, Boston, at 10:30 A. M., June 16, and will be preceded by a meeting of the Executive Committee at 9:30 A. M., and of the Board of Trustees at 10 A. M.

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MEETING OF RESEARCH COMMITTEE, MAY 1.

A special meeting of the research committee was held at the University Club, Boston, Mass., Friday, May 1 with the following present: Dr. W. E. Emley, chairman; Prof. H. J. Ball, Dr. W. F. Edwards, Prof. G. B. Haven, E. W. McGowan, Prof. L. A. Olney, A. R. Pierce, Prof. E. R. Schwarz, Dr. E. M. Shelton and Secretary C. H. Clark.

The Chairman announced the appointment of chairmen of the various sub-committees, and of district representatives of the committee on Contact with Industry who had accepted appointment. The particular functions of the various sub-committees were discussed and defined, as were the duties of the district representatives.

It was the sense of the meeting that the Institute should not undertake any problems which might be considered as "trouble-shooting", nor such economic problems as have no direct connection with scientific technical research; that the research committee as a whole shall pass upon the acceptability of any problem from the industry before any sub-committee will be permitted to undertake work on it; that a sub-committee, when it undertakes a particular problem, should discuss with the sub-committee on Contact with Industry the place where the problem can best be handled, and shall arrange with a cooperating laboratory for the final report to be submitted to the sub-committee on Bibliographies and Abstracts.

During the general discussion Chairman Emley announced that he had found in the correspondence of the committee a total of 70 different problems which had been suggested. It was learned that many of these problems are now being investigated. Secretary Clark thought that this information should be passed on to the members. Chairman Emley was therefore instructed to make a list of these problems to be sent to Secretary Clark with notice concerning those which are now under way at the Bureau of Standards, Mass. Institute of Technology and Lowell Textile Institute.

It was the unanimous opinion of all present that the United States Institute for Textile Research cannot properly perform the functions which it has undertaken until such time as it has its own laboratory facilities. The Chair was instructed to express this view to the executive committee.

RESEARCH COMMITTEE'S SUB-COMMITTEES.- Dr. W. E. Emley, chairman of the research committee, announces the appointment of the following chairmen of sub-committees, the latter having the responsibility of selecting the committee's personnel, which, at the start, will be restricted to about five members to facilitate work:

(1) Bibliographies and Abstracts:- Dr. W. F. Edwards, Director of Laboratories, U.S. Testing Co., New York City.
(2) Contact with Industry.- Prof. E. R. Schwarz, Mass. Institute of Technology, Cambridge, Mass.
(3) Academic Research.- Dr. E. M. Shelton, Cheney Bros. Research Laboratories, South Manchester, Conn.
(4) Mill Research.- Walter C. Taylor, Sec.-Treas., Southern Textile Association, Charlotte, N. C.
(5) Economic Research.- H.V.R.Scheel, Vice-Pres., Botany Consolidated Mills, Passaic, N. J.
(6) Testing Research.- Prof. H.J.Ball, Lowell Textile Institute, Lowell, Mass.

DISTRICT REPRESENTATIVES OF CONTACT COMMITTEE.- Among the responsibilities of sub-committee (2) on Contact with Industry, of which Prof. Schwarz is chairman, will be the checking of replies to the textile research survey for The Textile Foundation to ascertain whether or not anyone has been overlooked. The information as to textile research and facilities thus accumulated will be made the nucleus of a file that it will be the duty of this sub-committee, through district representatives, to keep up to date. The district representatives will also be expected to confer with the chairman as to the possibility of making cooperative arrangements in the assignment of a particular problem to a particular laboratory in their territory. The district representatives who have thus far accepted appointment are as follows:

(1) Maine, New Hampshire and Vermont.- E. W. McGowan, Wyandotte Worsted Co., Waterville, Maine.
(2) Massachusetts.- E. D. Walen, Agent, Worsted Div., Pacific Mills, Lawrence, Mass.
(3) Rhode Island and Connecticut.- Prof. E. R. Schwarz, Mass. Institute of Technology, Cambridge, Mass.
(4) New York and New Jersey.- B. H. Foster, U.S. Rubber Co.,Orange,N.J.
(6) District of Columbia.- Dr. W. E. Emley, Bureau of Standards, Washington, D. C.
(7) Virginia, West Virginia, North Carolina and South Carolina.- H. H. Willis, The Clemson Agricultural College, Clemson College,S.C.
(8) Georgia, Florida, Alabama and Mississippi.- R. H. Adams, Callaway Mills, LaGrange, Ga.
(9) Ohio, Indiana, Illinois, Kentucky and Tennessee.- George H. Johnson, Laundryowners' National Association, Joliet, Ill.
(10) Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Iowa and Nebraska.- Miss Ethel L. Phelps, Dept. of Agriculture, Univ. of Minnesota, St. Paul, Minn.

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NEW MEMBERS ELECTED

At the meetings of the Executive Committee held March 24th and May 12th, the following Contributing and Annual members were elected:

Contributing:

Deering, Milliken & Co., Inc., New York City,
represented by W. E. Winchester, Vice-Pres.

The Erwin Cotton Mills Co., West Durham, N. C.,
represented by K. P. Lewis, Sec.-Treas.

Lockwood-Greene Engineers, Inc., New York City,
represented by F. W. Reynolds.

Union Bleachery, Greenville, S. C.,
represented by R. W. Arrington, Vice-Pres.

Annual:

American Wool & Cotton Reporter, Boston, Mass.,
represented by C. Randolph Bennett.

Bausch & Lomb Optical Co., Rochester, N. Y.,
represented by I. L. Nixon.

Morgan Butler, Treas., Associated Textile Companies, Boston, Mass.

G. Edward Buxton, Pres., B. B. & R. Knight Corp., Providence, R. I.

Chicopee Mfg. Corp., New Brunswick, N. J.,
represented by Charles A. McCormick, Treas.

Leslie Christison, American Woolen Co., Andover, Mass.

Cold Spring Bleachery, Yardley, Pa.,
represented by R. B. Gilpin, Vice-Pres. and Gen. Mgr.

Cranston Print Works Co., Cranston, R. I.,
represented by H. S. Duckworth, Vice-Pres. and Gen. Mgr.

S. R. Cummings, The Hoover Co., North Canton, Ohio.

James McDowell, Medford, Mass.

Merrimac Chemical Co., Inc., Boston, Mass.,
represented by Francis J. Curtis.

Henry Miedendorp, Jr., Glen Rock, N. J.

Samson Cordage Works, Boston, Mass.,
represented by Herbert Pratt, Pres.

Sears,Roebuck & Co., Chicago, Ill.

Levon M. Yacubian, Stillwater Worsted Mills, Harrisville, R. I.

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USE AND ABUSE OF T. R. I. BULLETIN

Failure to make available to key men of member organizations the research abstracts and bibliography published in T. R. I. Bulletin may prove expensive to them in trouble and loss of time and to their firm in the cost of wasted time and effort.

An employee of a member organization, who sought records of what had been done on three problems he was investigating, was told that the information had been published in the last two issues of T. R. I. Bulletin. He had lost only a half day's time in his search, but if he had failed to contact with someone acquainted with U.S. Institute and its T.R.I. Bulletin he might still be engaged in his literature research.

Failure to use T. R. I. Bulletin efficiently is to abuse it.

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TEXTILE RESEARCH AND TECHNOLOGY COURSES

For the third successive year Mass. Institute of Technology, Cambridge, Mass., is offering summer courses in textile research and technology, particularly for students and members of the staffs of textile schools and of universities offering work in textiles. These courses are classified as follows:

Textile Laboratory, June 16-July 28, 1 to 4:00 P. M. daily, except Saturday. Tuition, $60.

Textile Technical Analysis, June 16-July 7, 9:15 to 10:15 A. M. daily, except Saturday. Tuition, $30.

Textile Microscopy, July 29-September 9, 9:15 to 10:15 A. M. daily, except Saturday, and 1 to 3:30 P. M. Monday, Wednesday and Friday. Tuition, $50.

The course in textile technical analysis will consist of 30 lectures, which will include discussions of graphic interpretation of data, report writing, precision of measurements and statistical methods as they apply to textile analysis. Supplementing this lecture work, a laboratory course of 90 hours will be given.

A new course in textile microscopy will be presented by Prof. E. R. Schwarz. This work will consist of 30 lectures and 45 hours of laboratory. The lectures will cover exhaustively the applications of optical and microscopical equipment to textile research, and will include micrometry, microtomy, photomicrography, use of polarized light, together with fibre, yarn and fabric analysis.

For those students who have already taken lecture work in textile microscopy, whether in the regular session or during previous summer sessions, arrangements may be made to take 90 hours of laboratory work in textile microscopy, omitting the lectures.

All of the courses are offered for credit towards either a Bachelor's or Master's degree. Further information regarding these courses may be obtained through the Summer Sessions office of the Institute, or direct from Prof. E. R. Schwarz.

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RESEARCH A VITAL PART OF MODERN BUSINESS

"Research is enjoying a vogue at present. At least the term 'research' is heard and read frequently. Let us face this matter frankly. 'Merchandising', 'Efficiency', 'Mass-Production' and 'Distribution' are other practical applications of industrial research which have enjoyed periods of popular exploitation. It is by the achievements of the few to whom these were constructive ideas and not merely resounding words that we measure the growth of American industry.

"We urge you to approach industrial research seriously and thoroughly. We feel that it is not a matter for patronage nor is it a panacea for all industrial ills. It is a vital part of modern business. It is the intelligent effort to prevent invisible waste in your plant and to prepare for a newer, closer competition in the industry of which your business is a part."- Testing, May, 1931.

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CURRENT CHANGES IN THE TECHNOLOGY OF COTTON SPINNING AND CULTIVATION.

Mather Lecture by Dr. W. Lawrence Balls, F. R. S.,
Before Textile Institute, Manchester, Eng.

The object of the lecture was defined by the author as an attempt to give an indication and outline of some changes which have already taken place in the cotton world, and to visualize the future trend of those changes. He maintained that "economic pressure on the one hand, and scientific method on the other, interact to a greater extent than is commonly realized. A stable industry, in a state of equilibrium with its markets and its competitors, is adequately served by its practical knowledge of everyday working practice; an Oldham mill spinning American cotton for the Indian dhooties at the end of last century was typically stable; the pre-war cultivation of Egyptian cotton is another instance. But when conditions change, trouble begins. The purely practical man can only experiment in mass, and most experiments are necessarily failures, so that the cost of experiments on the so-called practical scale is ruinous. The speedy and inexpensive technique of the scientific research worker can follow up such changes of conditions, or even move ahead of them, and much of the influence which the laboratories have acquired in the textile industries during the last decade is simply the expression of the changes which have been taking place in those industries.

"At the present day the industry may be described as having too many machines, which machines are individually too simple, with one exception, the mule; that it could utilize more complex machines satisfactorily is demonstrated by that exception."

He drew attention to the fact that the use of cotton as a textile pure and simple, for covering purposes only, is rapidly becoming less important, the center of gravity of cotton uses shifting towards purposes which may be described as those of engineering. "It is not a despicable engineering material; its tensile strength is comparable with that of mild steel, and no steel would endure the everlasting flexure undergone by the cords of a motor-car tyre."

He was unable to subscribe to the comfortable belief "that artificial silk has reached its limit of usefulness, that further improvements in it are unlikely, and that it will serve cotton for the future as an embellishment, not as a competitor." He believes it "far more likely that the past few years of competition between artificial silks and the fine cotton textiles has been a temporary phase, and that the prospective victims of the artificial fibres are the inferior kinds of cotton and yarn."

He drew attention anew to his belief that the industry's knowledge of cotton is still far in advance of its knowledge of cotton yarns. "It is true that yarn is a complex structure mechanically, by no means easily submitted to rigid analytical treatment, but an astonishing commentary on our erroneous treatment of its problems in the past is provided by our failure to realize that the singles yarn is not a finished product. Just because it is the end stage of cotton spinning we have regarded it as a product; yet in reality it is no more than a convenient form in which to carry the cotton away to the next process, whether for doubling or for weaving..... Thus it follows that the nearer we approach to the completed fabric or cord, the more do the properties of cotton itself assert themselves, and although the substitution of an inferior cotton becomes possible through technical

improvements in methods of construction, yet the better cotton will give the better result when other things are equal. The essential unity of interest between the technological problems of spinner and grower is thereby emphasized once more.

"The general position with regard to these changes in the technology of cotton spinning during the past two decades may be summed up by the statement that we have emerged from the stage of obsession by the machines themselves, and are concentrating our attention on the reactions of the cotton to the machines. Our former obsession by the machines was a natural survival of the justifiable pride in machinery which marked the industrial revolution; we are now passing into a stage when physical science is taking control.

"Following the industry from the seed bed to the doubling mill we can see reason to expect an intensification and specialization of the agriculture of cotton, with a concomitant disappearance of the inferior kinds from the world's markets. Such inferiority will not be judged merely in terms of length, but the short staples will probably disappear, and (although the general tendency to increase the length of staple cultivated will probably continue) it is likely that exceptionally long cottons will also be at a disadvantage. The structural advantage given in yarn by each additional millimetre of length is a diminishing quantity, and it may well be the case that the convenience of being able to feed all kinds of cotton into similar roller settings will eventually lead to a kind of standardization of length, leaving the differences of demand to be adjusted in terms of fineness, because such differences in fineness call for relatively small alterations in machine setting compared with those demanded by length differences.

"In an experimental plant for spinning-test work, I should feed high-grade cotton almost direct from the gin to the card; how the same result might be achieved in commercial practice is well worth study.

"Less remote than the possibilities of sorting are the possibilities of employing super-drafts, so that the transition from the finishing draw-frame to the yarn may avoid the successive passages of fly-frames, with their concomitant labour costs. In collaboration with Mr. F.Hutchins I have demonstrated the possibility of satisfactory spinning direct from the draw-frame sliver into 100's count with a single super-draft of two hundred; there is a ring-spinning machine actually on the market which uses two stages of high draft on the same frame to achieve the same result; there are possibilities in physical research on the hair which might give us super-drafts by other means than mechanism. That super-draft machines would be complex and expensive is self-evident; some of their moving parts would have to be built to far higher standards of accuracy; more specialized operatives would be required to supervise them. But in order to pay for the machines and for the labour, we can draw on the money which at present we pay not only for the spinning machines but also for three sets of fly-frames and for the labour which attends to them.

"Still nearer to actual realization within a very few years is the advent of a satisfactory continuous spinning machine. In this case not only is the theory adequately worked out, but the simple practical means of accomplishing it only wait commercial development. I refer to the arrangement which I designated as the 'Rule' frame, it being a ring-frame with nearly all the good points of the mule. A frame built on these lines--namely, with a long stretch of freely vibrating yarn between the drafting rollers and the spindle--is already on the market as the result of quite

independent investigations in Germany; curiously enough, this Hartmann machine misses an essential characteristic of my rule-frame, in that it retains the unnecessary and disadvantageous constraint of a thread-guide. I have a strong belief in the possibilities of this type of spinning machine."

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PARTICIPATING LABORATORIES REPORT ON RESEARCH IN PROGRESS

In the February issue of T. R. I. Bulletin it was noted that Mass. Institute of Technology, Cambridge, Mass., the U. S. Bureau of Standards, Washington, D. C., and the Lowell (Mass.) Textile Institute had qualified as participating laboratories of U. S. Institute. It was also noted that of four major problems selected by the research committee as being of "sufficient public interest to justify investigation by the Institute," studies were in progress in the participating laboratories on the three following subjects: (1) 'Scientific Study of the Wear of Fabrics and the Development of Methods for Measuring Resistance to Wear; (2) Investigation of the Relative Suitabilities of the Present Methods for Testing Yarn; (3) Development of Testing Methods for the Fastness of Dyes.

These participating laboratories have been asked for progress reports regarding this and any additional textile research, and the following brief resumes should be found of interest:

M. I. T. TEXTILE LABORATORY.- By Prof. E. R. Schwarz.- One of the major problems adopted for study by the United States Institute for Textile Research was the matter of the measurement of abrasive resistance of textiles. As a further study in this matter the textile laboratory has just added to its equipment a photometer head of the latest design which is to be built into a special apparatus and used among other things for the measurement of change in reflecting power of fabric surfaces during abrasion.

Work is also in progress in the study of a second of the major problems proposed by the U.S.I.T.R.--namely, the study of methods of yarn testing. This research in its initial stages has to do with the effect of fibre strength upon the strength of yarn. The first portion of the work will be carried on with normal and spun rayon yarns of varying structures. The machine for the measurement of the stretch and strength of individual rayon filaments has been designed and constructed, and will be modified as necessary to continue this work for other fibres and to improve the convenience of its operation.

Also, on this same subject, a comprehensive program is now under way upon the microscopical analysis of yarn structure. The work so far done has resulted in valuable information as regards cork-screw, twist measurement, and the determination of contraction due to twisting. Much of this material has hitherto been unpublished and it is hoped that it will later be set forward in detail in T. R. I. Bulletin.

Work progressing through the last five years is continued on the design and application of optical equipment to textile research. Recent results have been the development of technique for the production of direct color photomicrographs of textile specimens by polarized light for the study of structure as a start toward a possible development of a photo elastic technique for fibre. Further developments have been made in the technique

required for the production of stereoscopic photomicrographs by means of the ordinary monocular microscope, with good success. The latest development is the design of a special textile micro manipulator which we hope will be accomplished during the coming year.

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U. S. BUREAU OF STANDARDS LABORATORY. (Abstract of report by Dr. W. E. Emley).- Research completed or in progress at the Bureau of Standards on the major problems recommended by U. S. Institute research committee for initial study includes a new machine for measuring the durability of carpets; this is now in actual use and a detailed description will soon be published.

The effects of various methods of spinning on the properties of cotton yarns are being studied in the Bureau's mill. The tensile strength of yarns is being measured by three different methods: The single-end break; the skein break and the multiple-strand break. The work on coarse yarns has been completed and is now being prepared for publication. The work on fine yarns is now under way.

As to the development of testing methods for the fastness of dyes it may be stated that in cooperation with the American Association of Textile Chemists and Colorists, a great deal of work has been completed and recorded in the Year Book of that Association. The Association recently engaged a full-time research associate who is continuing these studies at the Bureau.

Regarding certain other problems suggested by members of the Research Committee, or to that Committee, but that have not been officially recommended for study by Participating Laboratories, it may be stated that the textile laboratory of the Bureau of Standards is actively at work upon a study of the hygroscopicity of fibres, including the hysteresia involved; that a study of durability of weighted silk is being investigated in cooperation with the American Home Economics Association; and that, following development of methods and apparatus for measuring the spectral reflection of fabrics, the translation of the results into terms of color is being studied.

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LOWELL TEXTILE INSTITUTE.- In a recent report on the work of the research committee of the American Association of Textile Chemists and Colorists, Prof. Louis A. Olney noted that two full-time research associates have been added to its staff, one at the Bureau of Standards and one at Lowell Textile Institute. In addition to the organized work of the Association's various sub-committees on dye fastness, special studies are being conducted by the research associates on the following subjects: Factors involved in the deterioration of silk on exposure to light; study of the iso-electric point of wool with the object of determining and checking its determination by several methods, and to obtain, if possible, a simple and practical method of iso-electric termination which will be applicable to the average woolen mill.

Under the supervision of Prof. H. J. Ball a senior student of L.T.I. is helping to develop in his thesis work a machine for testing the lustre of fabrics. It is stated that the effect of fabric lustre on the amount of lustre indicated by the machine is to be eliminated by mounting the samples on a revolving drum. Complete particulars of the machine will be available in the near future.

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(Arranged Alphabetically by Major Subject)

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ABSTRACTS

THE DENIEROMETER.- C. E. Mullin.
Kunstseide, Vol. 12 (1930) #10, P. 384-386.

The description of a new instrument for the determination of the denier of rayon and silk and the variation of the same from point to point in the yarn. The principle of operation is the determination of the wave length of vibration produced in a measured strand of yarn held vertically at known tension. A scale is provided to give the measurement of the distance between one node and the second successive node for substitution in the formula $d = \frac{F}{4h^2 n^2}$ where "d" will equal the mass of the yarns in grams per centimeter, F will equal the force in dynes applied as tension, and n will equal the frequency of the vibration of the strand. The scale of the instrument is calibrated in deniers (evidently directly determinable from "d".) A second strand protected by means of a glass tube is also set in vibration and the displacement of a given node either side of a zero point reads directly the percent correction to be added to or subtracted from the main scale reading due to any vibration in the frequency of the current supplied. The machine was developed in France for work with rayon.

Three illustrations are included, the first a diagramtic set-up of the machine; the second photograph of the machine before the samples have been placed in position (this picture unfortunately is printed up side down); and a photograph of the machine in use. Details are given as to the necessary technique and a brief statement of the precision which is stated to be within 5%. An advantage to be emphasized is the fact that no cutting of the yarn is necessary and that a skilled operator is not required. (S)

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A NEW DEVICE FOR RECORDING THE EVENNESS OF RAW SILK.- W. F. Edwards. (Abst. of a paper delivered at a recent meeting of Committee D-13, A.S.T.M.)
The Melliand, Vol. III-2 (1931).

Several mechanical new devices made for the determining of variation in evenness of silk are described ranging from the use of Mirror cards to the Seem gauge. Mention is also made of several of the newer devices, among them an instrument employing a photo-electric cell worked out by Huber and Reinharts in the laboratory of Cheney Brothers. The new device produces a chart record. Photographs of the instrument and of the charts are many, but if the original paper contained any detailed explanation of the method employed and the construction of the apparatus, it is omitted here. (S)

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MICRO ANALYSIS OF YARNS.- E. R. Schwarz.
Textile World, April 18, 1931, May 23, 1931.

Article XII of a series on textile microscopy is concerned with quantitative analysis of such properties of yarn as structure, compactness, twist, twist contraction, fiber content, diameter, balance, etc..... The first section gives hitherto unpublished data relative to micro twist determinations in single and plied yarns. Further paragraphs deal with corkscrew, dye and sizing penetration, and briefly describe the necessary apparatus and technique. (S)

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COTTON YARN DIAMETERS.- George Fuller.
The Melliand, Vol. III-2.

A rather vague article in which diameters of a series of single yarns range from 6^S to 120^S and 2 plies from 10/2 to 120/2 were studied. Two formulae were used to compute diameters and the results are shown to be widely variant from the measured values particularly in the higher counts. It is briefly mentioned that the derivation of these formulae was probably empirical and that they could not be expected to hold for anything but a limited range of counts. Averages of only four measurements are given in each case, and the description of the instrument which is of the type of a modified thickness gauge is extremely vague. A statement which is somewhat difficult of interpretation is made by the author as follows: this method of test "might limit the effect of moisture variation in cloth and yarn, that is, the percent of moisture now affects the weight and necessarily the yarn size, whereas the diameter reading might not be as variable or less variable." Since the whole attempt of the article seems to be a comparison of yarn diameter with size, the above seems somewhat beside the point. (S)

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A QUICK AND PRACTICAL ROUTINE METHOD OF OBTAINING CROSS SECTIONAL PHOTOGRAPHS OF ANY TEXTILE.- P. V. Perrott.
The Industrial Chemist, Vol. 6 (1930) August, P.325, 365.

The first part of the article is concerned with the staining and embedding of the yarn or filaments ready for sectioning, together with the technique of cutting sections with the microtome. The strands of material are held under tension in parallel position between arms of a special wire frame approximately 2 inches long.

The author recommends stains as follows: for cotton, viscose, cuprammonium, jute, flax and similar textiles.

	Benzopurpurine 4 B.S.	0.5 grms.
	Oleic acid soap	0.5 "
	Sodium Chloride	2.0 "
	Water	100 c.c.

For wool and real silk:

Erio Floxine 2 G (Geigy Dye)	1 grm.	
Acetic acid (glacial)	2 c.c.	
Water	100 c.c.	

Collodion of the following composition is used for the first embedding.

Low viscosity nitorcellulose	30 gms.
Ethylene glycol	5 gms.
Butyl Acetate	60 gms.
Cyclohexanone	5 gms.
Triphenyl phosphate	25 gms.

The embedding is carried out in a vacuum flask (25"Hg) until the air bubbles are removed from the fibers (15 minutes). It takes 30 to 45 minutes to dry over a hot plate. Final embedding is done in beeswax. The final mass after cooling is cut to a convenient sized candle and mounted on a block of wood for insertion in the microtome. Sections are projected thru the microscope onto sensitized film and after developing, contact prints are made on extra-contrast paper. (S)

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CRIMP IN WOOL AS A PERIODIC FUNCTION OF TIME.- M.H.Norris & C.C.Claassens. Journal of the Textile Institute, Vol. 22, #4 (1931).

A unique set of samples of merino wool, all cut from the same animal at monthly intervals during the whole of its life of 31 months, have been examined for fiber length, number of crimps per fiber, and variation in thickness along the fiber length. The results support the suggestion that crimp formation is a periodical function of time. No relationship was found between the variation in fiber length and the variation in the number of crimps per fiber. Measurement of fiber thickness clearly showed the influence of seasonal conditions on the thickness of fiber, and the variation was remarkably constant in different fibers measured. Further studies were made of some locks of New Zealand Romney and Corriedale fleece wools which further substantiated the statement that no relationship exists between fiber length and number of crimps per fiber. Careful statistical analysis of the data was made and numerous charts are included in the report as well as two photomicrographs of abnormalties in diameter are reproduced. During the investigation an interesting fact regarding the phenomena known as hypertrophy and atrophy became evident. Since the fiber diameters were measured on a fiber rotator, the possibility of determining axial ratios without cutting cross sections indicated that the change in ratios is great. The change in cross sectional area is to small to be significant.(S)

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DYEING APPARATUS FOR TEXTILE LABORATORIES.⁄ (Dischreits)

A double-limbed tube is employed for the work. In the left leg is a perforated plat upon which the fiber, etc., is deposited. A plunger rod passing through a rubber stopper at the top of this tube carries at its lower end a glass spiral which serves to hold the material to be dyed in place but will not interfere with the free circulation of liquid. A by-pass tube connects the limbs, and contains a check valve of the float type. The right leg also contains a check valve of the same construction near its base, and below the by-pass entrance. Above the latter is a tightly fitting plunger passing out through a stuffing box which surmounts the tube. When this plunger is raised any liquid in the apparatus is drawn through the sample by suction, and on the return of the plunger is forced down through the fiber. Thus a constant circulation of the liquid is possible, while the sample is under inspection directly through the glass of the tube.(S)

⁄Made by: Leipziger Glasinstrumenten-Fabrik.

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Determination of pH of Cotton Cloth and Study of Its Relation to Tensile Strength,-by S. I. Kolsky and B. M. Jones, Lowell Textile Inst., 1930. American Dyestuff Reporter, March 2, 1931, P.133.

The introduction to this study, which was undertaken in partial fulfilment of the requirements for a degree of B.T.C. at the Lowell Textile Institute, draws attention to the fact that very little work had been done to investigate practicable methods for determining slight traces of acid or alkali in cotton cloth and their effect on tensile strength, although it has been known that relatively small amounts of acid or alkali have caused tendering in cotton cloth at some stage in its processing, or even after long storing.

The experiments described in this paper show the effect of pH on the tensile strength, and the facts indicate that manufacturers should control the pH during all the finishing and bleaching operations in order to have the cloth as strong as possible. It had been shown previously that slight decreases of pH from the standards tendered the cloth greatly. It was found that an ordinary bleached cloth is strengthened by treatment with dilute alkali. A pH determination would show what concentration of alkali should be used to get the maximum strength.

Further Studies Suggested

The most important feature of the paper is the suggestion that this work is the logical beginning of similar work on a series of other acids and alkalis and on other fabrics. "Hydrochloric, phosphoric, acetic, formic, oxalic and tartaric acids should make a most enlightening series; and as well as the alkalis, sodium carbonate and the phosphates should prove interesting studies. Heat-treatment with the hot-iron apparatus should not be overlooked, because valuable information lies in the determination of the effects of heat on cottons containing the various acids listed above.

"Experiments along this line, however, need not be limited to bleached and unbleached cotton; the pH and tensile strength determinations of sulfur-dyed cloth, vat-dyed cloth and cloth dyed with insoluble azos or other dyes (especially those employing acids or alkalis in the process) should be of interest.

"All these offer fields for research on cotton alone, but similar determinations can be applied to the other fabrics: wool, silk and the rayons as well.

"Thus, this research (which in itself proved most interesting) opens the possibilities for an almost limitless line of research that must surely be of value to the investigators and to the industry."

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Copies of Matter Abstracted

The Secretary will endeavor to provide members with mimeograph or photostat copies at cost of articles and other matter abstracted that they cannot obtain otherwise. Most of the publications, however, may be consulted at leading public or other libraries, and most of the books, pamphlets and periodicals may be obtained from their respective publishers.

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BIBLIOGRAPHY

WHIDBOURNE STROBOSCOPE AND SPEED COUNTER.
The Industrial Chemist, July, 1930.

Description of an ingenious instrument for studying high speed machinery which is operated by means of a jet of air from a specially arranged rubber bulb. The range of the instrument is from 150 to 40,000 revolutions per minute. (S)

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SPECTROSCOPIC ANALYSIS OF TEXTILE ASH.- S. J. Lewis.
Textile Manufacturer, Vol. 56 (1930) P. 338.

The advantages of spectrographic analysis for the detection of minute quantities of mineral substances in textiles is described. The possibilities of the application of the method to detection of the cause of stains on fabric are outlined. (S)

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THE LUSTRE OF TEXTILE FIBERS AND THE METHOD OF MEASUREMENT.- M.O.Pelton.
Transactions of the Optical Society of London, Vol. 31 (1929-1930).

The lustre of textile fibers is due to a geometrical property of transparent cylindrical filaments with polished surfaces. Some of the factors, notably double refraction and defraction, which might affect lustre are discussed, and a method is suggested for measuring lustre based on the high lights visible on a curved lustreless surface. (Abst. from Bausch & Lomb Abst. Bulletin, Vol. 1-5)

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THE STRUCTURE OF CELLS OF VEGETABLE FIBERS.- M. Luedtke.
The Melliand, Vol. II-8 & 9 (1930).

The possibilities of chemical and microscopical analysis of the fine structure of fiber cells. (S)

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MICROSCOPY OF VEGETABLE FIBERS.- H. Ellis.
Textile Recorder, Vol. 48 (1930).

A very elementary series of articles for the beginner in Textile Microscopy. (Abst. from Bausch & Lomb Abst. Bulletin, Vol. 1-5).

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THICKNESS MEASUREMENTS UNDER THE MICROSCOPE.- Karl John.
Zeitschrift fur Instrumentenkunde, Vol. 50 (1930) #11.

A discussion of the factors influencing the making of thickness measurements with the microscope by successive focussing, and the value of these factors. (Bausch & Lomb Abstract Bulletin, Vol. 1, #5).

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COMPARATIVE STUDY ON CELLULOID ACETATES.- H. Stadlinger.
The Melliand, Vol. II-9 (1930) Pp. 1227-1233.

The last of a series of articles which have stressed the value of microscopical study of cross sections for the quantity control of fabric. Use was made of photomicrographs for illustration. (S)

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THE DETERMINATION OF COVERING POWER OF RAYON FROM THE FILAMENT CROSS SECTION.- H. Schloemer.
Kunstseide, Vol. 12, #10 (1930) P. 380-383.

A brief article pointing out how with diagrams several methods for expressing a ratio to indicate covering power are departure from circular cross section of rayon. (S)

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SOME EXPERIMENTS IN SILK SOAKING.- Neville and Marshall.
Ind. and Eng. Chem., Vol. 23, Jan., 1931.

The use of an oil immersion objective of high power is recommended for the study of the emulsions used in this work. Photomicrographs illustrate the material. (S)

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MILDEW PROBLEM WITH COTTON AND WOOL MATERIALS.- A. J. Hall.
American Dyestuff Reporter, Nov. 10, 1930.

The last of two articles on textile microscopy. (S)

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COLOR REACTION AS A MEANS OF IDENTIFYING VAT COLORS ON COTTON.
American Dyestuff Reporter, Feb. 2, 1931.

A tabulation of the color reactions obtained with a number of reagents on several hundred dyes. (S)

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RAPID DETERMINATION OF MOISTURE.- Fairbrother & Wood.
The Industrial Chemist, Nov. 1930. (Vol. 6).

The tedious and delicate distillation method is briefly described, and then the remainder of the article is concerned with the applications of a device depending for its action upon changes of the dielectric constant. The work was done on wheat, but is applicable to other materials including textiles. See also Canadian Journal of Research, Vol. L, No. 2. (S)

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WEIGHTS.- Richard Rimbach.
Instruments, Vol. IV-4, P. 215-223.

The conclusion of the preliminary publication of chapter #1 of a proposed hand book on laboratory apparatus. How to have weights checked by the U. S. Bureau of Standards is described and the classes are outlined. A bibliography of 16 items is appended. (S)

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